

DEPARTMENT OF THE ARMY
US Army Engineering and Housing Support Center
Fort Belvoir, VA 22060-5516

Technical Note
No.420-41-1(Revision 1)

21 January 1992

DIRECTORATE OF ARMY POWER PROCUREMENT
UTILITIES CONTRACTS

GUIDANCE FOR CALCULATION OF RATES
FOR THE SALE OF UTILITIES SERVICES

1. Purpose. The purpose of this technical note is to provide guidance to MACOMs and installations for the development of rates for the sale of utilities services by Army installations.
2. Applicability. This Technical Note applies to all facilities engineering and housing activities in CONUS and OCONUS. All other guidelines presently in use by various installations will be replaced by this Technical Note.
3. References:
 - a. AR 420-41, Facilities Engineering, Acquisition and Sale of Utilities Services dated 15 September 1990.
 - b. AR 215-1, The Administration of Army Morale, Welfare, and Recreation Activities and Nonappropriated Fund Instrumentalities dated 10 October 1990.
4. Discussion.
 - a. Reference 3a requires that all contracts for the sales of utilities services be reviewed annually. The utilities services/sales officer will determine the correctness of rates and the continued necessity of the sales. Rates shall be changed when costs of services increase. Every installation should use a standard format to present the computation of the rates. This will facilitate review by the Army Power Procurement Officer Representative.
 - b. Reference 3b governs the Army's Morale, Welfare, and Recreation (MWR) system and supporting Nonappropriated Fund Instrumentalities (NAFIs).

This technical note supersedes Technical Note 420-41-1 dated 1 September 1989.

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c. Appendices A through C provide the guidance necessary to develop a standard system for the computation of rates for the sales of utilities services on Army installations as follows:

- (1) Appendix A - Detailed Guidance
- (2) Appendix B - Categories and Rates
- (3) Appendix C - Rate Calculations

5. Point of Contact. Questions regarding the sales of utilities services in Army installations should be directed to the Deputy Army Power Procurement Officer, U.S. Army Engineering and Housing Support Center, ATTN: CEHSC-C, Fort Belvoir, VA 22060-5516 at DSN 345-7362 or Commercial 703-355-7362.

FOR THE DIRECTOR:

A handwritten signature in black ink, reading "Thomas J. Evans". The signature is fluid and cursive, with a large loop at the end of the last name.

THOMAS J. EVANS, P.E.
Deputy Army Power Procurement Officer

Encls.

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APPENDIX A
GUIDANCE FOR CALCULATION OF RATES
FOR THE SALE OF UTILITIES SERVICES

DIRECTORATE OF ARMY POWER PROCUREMENT
US ARMY ENGINEERING AND HOUSING SUPPORT CENTER
FORT BELVOIR, VIRGINIA 22060-5516

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CHAPTER 1 - Introduction

1-1. Purpose. This Technical Note helps explain Army procedures for the sale of utility services. Procedures to develop contracts for the sale of utilities services, negotiate sales contracts and for the use of proper forms are found in Chapter 3 and Appendix C of AR 420-41.

1-2. Scope. Within this guide, detailed information is provided for:

- a. Categories of Purchasers and Rate Classes.
- b. Components of Rates.
- c. Consumption Determination.
- d. Rates Computations.
- e. Meter Reading.
- f. Billing.
- g. Determination of categories and rates.
- h. Rate calculations with formats.

Chapter II - Categories of Purchasers and Rate Classes

2-1. Categories. Purchasers with a common rate class or common exceptions imposed by one Army Regulation are placed under one title called a category. The categories of purchasers listed below and in Appendix B have been expanded over those in AR 420-41, Chapter 3-2, to furnish more information on applicable rate classes and references to governing regulations.

a. Army. Included in this major group are all buildings, structures, facilities, and activities under Army jurisdiction which are located on Army owned or leased property and operated with Army appropriated or non appropriated funds. Activities required to reimburse the Government for utility services, in part or entirely, are listed below and in Appendix B.

(1) Morale, Welfare and Recreational (MWR) Activities. AR 215-1, Chapter 2, Section IV - gives titles to the categories and names the types of activities within categories. Category titles and number of types of activities listed in each are:

(a) Category A. Mission Sustaining Activities. Ten types of activities.

(b) Category B. Basic Community Support Activities. Nine types of activities.

(c) Category C. Business Activities. Twenty two types of activities. Included in these 22 types is the Army and Air Force Exchange Service with 19 related activities, some of which are normally operated by concessionaires, and the supplemental mission activities/funds with 13 other operations.

(2) Family Housing. Army owned or controlled housing.

(3) Rental Quarters. Quarters owned or controlled by the Army and rented to military or civilian personnel.

b. Other DOD Activities. This includes Air Force, Navy and Defense Agencies.

c. Federal Non-DOD. Includes executive departments, independent establishments of the Government and related bureaus other than DOD related. Some examples are: Federal Aviation Administration and the U.S. Coast Guard.

d. State and Local Governments. The National Guard and public schools.

- e. Private Organizations. Three types of Private Organizations (POs).
 - (1) Type 1 - Federally Sanctioned.
 - (2) Type 2 - Affiliated.
 - (3) Type 3 - Independent.
 - f. Commissaries and Related Areas.
 - g. Lessees. Lessees of Army facilities for private commercial purposes.
 - h. Contractors.
 - (1) An individual, firm, or corporation which is performing work on the installation as a designated contractor.
 - (2) Construction. A construction type contractor working on an installation using Military Construction, Army funds.
 - i. Vending Machines. Not a true category, but listed here and in Appendix B because of its high visibility. Vending machines are defined as private machines used for retail sales. The Rate class for the machine will be the same as for the owner.
 - j. Public and Private Utility Companies. Sales are limited to electrical energy generated from alternate energy or cogeneration type production facilities under Army jurisdiction.
 - k. Purchasers Located Off-Post. Purchasers located outside the installation property are limited in their purchasing capability as specified in AR 420-41.
- 2-2. Army Rate Classes. A Rate Class is a division of rates for specified user groups which are set by AR 420-41 and other Army Regulations listed in the NOTES FOR APPENDIX B. Classification of utility services rates for activities are set by AR 420-41. Appendix B lists the Categories of purchasers with their rate classes. Notes provide the titles of the governing ARs. Extracts of the ARs explain exceptions. Rates are always specified as a unit cost.
- a. Rate A. This rate represents costs to produce and distribute a utility service. Costs included in Rate A are:
 - (1) Operation and Maintenance of the installation utility plant. When the utility service is purchased rather than generated, the purchase cost replaces the installation utility plant Operations and Maintenance cost.

(2) Operation and Maintenance costs of the distribution or collection systems.

(3) Line losses of the distribution system or gains of the collection system.

(4) Other related costs not included in O&M or line losses or gain. (Chapter III, paragraph 3-5).

b. Rate B. This rate represents the cost for Rate A plus Capital and Administrative Costs. Costs included in this rate are:

(1) Operation and Maintenance of the installation utility plant. When the utility service is purchased rather than generated, the purchase cost replaces the installation utility plant Operations and Maintenance cost.

(2) Operation and Maintenance Costs of the distribution or collection systems.

(3) Line losses of the distribution system or gains of the collection system.

(4) Other related costs not included in O&M or line losses (Chapter III, paragraph 3-5).

(5) Capital Cost.

(6) Administrative cost.

c. Local Prevailing Rate (LPR). This rate represents a cost equal to that charged to a particular customer class or type by the nearest supplier of a similar class or type of utility service.

Chapter III - Components of Rates

3-1. Rate Determination. Each rate class is determined by a specific group of costs associated with the utility service. Components are those costs associated with the production, delivery, Government expenditure for facilities and administration of the function. These components are discussed under the following headings.

3-2. Operation and Maintenance (O&M) Costs. O&M costs are expenses for materials and labor (in house or contract) to operate systems, and maintain the Army owned facilities. Specific codes in the Army Management Structure are used to collect costs for operation and maintenance of a utility system. Prior fiscal year data is used in the annual rate calculations.

3-3. Purchased Utilities Services. When utilities services are purchased, the unit cost of the purchased utility replaces the Operation and Maintenance Costs of plants as a part of the O&M component. Use the unit cost specified in the purchase contract for all services except electrical. Electrical service rates are made up of many parts which vary with the amount and manner of use. Therefore, the correct method to determine the average Government purchase rate is to divide the total annual cost by the total annual units consumed.

3-4. Line Losses or Gains. Line losses are associated with distribution systems. Line gains are associated with collection systems. Losses or gains are factored into the costs as a percentage of the Operations and Maintenance unit cost. Suggested loss or gain percentages are given in Appendix C for each type of utility. **When installation data indicates that other percentages are appropriate, use that data in place of the suggested percentages.** The factors which affect the line losses or gains are summarized for each service.

a. Electrical Systems. Line losses are dependent on voltage, wire size, length of run and age or condition of the system. Calculations of line losses can be accomplished using local formulae or formulae in the National Electrical Code (NEC) or National Electrical Manufacturers Association (NEMA) Handbook.

b. Water. Line losses are dependent on pressure, size and type of pipe, condition of joints and length of run. Calculation of line losses may be according to the National Plumbing Code or local formulae.

c. Gas. Line losses are dependent on pressure, size and type of pipe, condition of joints and length of run.

d. Steam, Hot Water. Line losses are dependent on size and type of pipe, insulation, condition of joints and length of run.

e. Compressed Air. Line losses are dependent on pressure, size and type of pipe, condition of joints and length of run.

f. Mechanical Refrigeration or Air Conditioning from Central Plants. Line losses are dependent on pressure, size and type of pipe, location (above or below ground), insulation, and length of run.

g. Gains of Sewage Collection Systems. Infiltration (gain) varies with the length and diameter of the sewer line, its material, the care used in construction, the depth of the line below the water table, and type of joints used.

h. No line losses or gains are associated with the following utilities sales because of method of delivery:

- (1) Ice.
- (2) Garbage.
- (3) Refuse Disposal.

3-5. Other Utility Costs. These are the costs of power and other utilities that are not included in O&M accounts, which are required to produce the service. The cost of electric power to operate pumps is one example.

3-6. Capital Charges. Capital Charges are computed as 10 percent of capital costs which include the original cost of facilities plus any Military Construction Army (MCA) cost for improvements, conversions or upgrades for a particular utility service. Capital cost figures may be obtained from Real Property Records or the Integrated Information Systems Assets Accounting Module (IFSAAM), where available. The annual capital charges are computed as 10% of the cost of the Army plant and the distribution or collection systems providing services. See Appendix C for calculation methodology.

3-7. Administrative Overhead. This cost includes meter reading, billing, administration and other indirect costs. Administrative overhead is set at 3% of the sum of unit costs for O&M, line losses or gains, other costs, and capital charges.

Chapter IV - Consumption Determination

4-1. Metered Service. Meters are the preferred method for determining consumption except when the annual charge for service is estimated at less than \$360 per year. Procedures for meter reading are discussed in Section VI.

4-2. Non-Metered Service. Various methods are suggested in this paragraph to compute consumption. Select the method most suitable, considering the total amount that the purchaser will pay, the manpower available to the utilities services/sales officer, funding available for equipment or studies, and MACOM preferences. Four methods to compute non-metered consumption are described below. Comments on their application for each type of utility service are made in the next sub-paragraphs.

a. Temporary Metering. A temporary meter may be used to collect data during periods of typical use. Bills (monthly or for other selected periods) are based on results of temporary metering. Significant changes to purchaser's operations or equipment use will require re-measurement.

b. Comparison. When the consumption by a similar facility or activity where consumption has been determined by metering or engineering analysis is used as a basis for estimate. Adjustments for slight variations in structure, equipment, and purchaser's operations, may be made using either consumption tables or engineering analysis.

c. Consumption Tables. Design Manuals, Facility Planning Manuals, and Association Handbooks may contain tables with number of units used on the basis of per square foot per person, or some other relationship. The consumption may then be estimated from the tabular values. Be sure that the underlying assumptions in the table correspond to those of the activity under consideration.

d. Engineering Analysis. Data is collected on all physical properties of the purchaser's facility and method of operation. Examples of data collected are: dimensions of the space used, properties of building components including R-Values, properties of equipment, hours of operation, number of employees, and number of visitors. Consumption is determined by engineering calculations following methods and formulae from industry or Government manuals or handbooks.

4-3. Application of Methods. The four methods for estimating consumption for each utility services are discussed below:

a. Electric Power. Consumption is usually measured in kilowatt hours (KWH).

(1) Temporary Metering. Relatively inexpensive, and readily installed and removed. Care needs to be exercised in selecting a period

representing typical use.

(2) Comparison. Most appropriate when only lighting loads and equipment loads are connected to the electric power. Variations in the number of light fixtures or pieces of equipment may be adjusted with minimum calculations. It may become complex when the electric power for heating and cooling is added to the lighting and equipment loads in a multi-use building.

(3) Consumption Tables. The unit lighting loads per square foot by type of occupancy are listed in Table 220-3(b) of the 1990 National Electric Code Handbook. Other Handbooks or design manuals may contain similar tables which can be used. Consumption tables for equipment are not available because of the great variety of equipment for the same type of occupancy.

(4) Engineering Analysis. Data collected will consist of: lighting wattage, equipment, and other devices connected to the electric system and hours of operation. Calculations can be made for any time period selected using the procedures in the National Electrical Manufacturers Association Handbook, Total Energy Management.

b. Water. Consumption is usually measured in thousands of gallons (Kgal).

(1) Temporary Metering. Installation and removal of a temporary meter may be practical or impracticable depending on location of the pipe where a temporary meter would be attached. The cost of installation and removal in comparison to the expected monthly charge should be the basis for making a decision on the use of temporary metering.

(2) Comparison. If similar operations and like facilities exist, this is a practical and economical method.

(3) Consumption Tables. Tables are available for average daily gallons used per capita by facility type. Army design manuals may be used. Table values multiplied by number of users provides an estimate of consumption with a minimum of data collection and computation effort.

(4) Engineering Analysis. Use methods specified in the National Plumbing Code Handbook.

c. Gas. Natural and other Gas used for heating. Consumption is usually measured in Million British Thermal Units (MBTU) or million cubic feet (MCF).

(1) Temporary metering. Suitable if resources required for temporary metering are justified by the amount of the annual charge.

(2) Comparison. Adequate where space, construction and heating equipment are similar.

(3) Consumption Tables. Usually given only for each piece of equipment in terms of cubic feet of gas used per unit of time. An engineering analysis must be made to obtain satisfactory estimates. See (4) immediately following.

(4) Engineering Analysis. Gather data on non heating equipment being furnished gas and the time periods that the equipment is in operation. From manufacturer's manuals determine cubic feet of gas used during the period of time and multiply it by the hours of operation to obtain MCF consumption of non-heating gas operated equipment. For heating equipment using gas, the heating requirements have to be computed first. Follow procedures as stated in d.(4) below. Then the gas used in heating equipment may be computed using the manufacturer's data on the amount of gas required to produce the heat requirement.

d. Steam, Hot Water. Consumption is usually measured in Million British Thermal Units (MBTU).

(1) Temporary Metering. Suitable method with regard to cost benefits.

(2) Comparison. Adequate when similar facilities and functions exist.

(3) Consumption Tables. Not recommended due to the great variation in the equipment used, types of operations, and weather conditions.

(4) Engineering Analysis. Collect data and calculate using the method in Chapter 25, Heating Load, of the 1985 American Society of Heating, Refrigeration and Air Conditioning Engineers Handbook of Fundamentals. This chapter covers:

- a. general procedures
- b. design conditions
- c. estimating temperature in adjacent unheated spaces
- d. calculating heat loss from crawl spaces
- e. calculating transmission heat losses
- f. calculating heat losses caused by infiltration
- g. internal heat sources and pick-up loads.

e. Compressed Air. Consumption is usually measured in thousands of Cubic Feet (KCF) at a given pressure.

(1) Temporary Metering. Usually economical but it may be difficult to determine the time of typical use.

(2) Comparison. Adequate when like equipment and usage exist and have been calculated from tables.

(3) Consumption Tables. Equipment manuals provide indirect power required for operation.

(4) Engineering Analysis. Collection of information on number of pieces of equipment, delivery rate and periods of use. Calculate consumption of air and electric power required to produce the air.

f. Mechanical Refrigeration, Air conditioning. Consumption is usually measured in tons.

(1) Temporary Metering. Not practical unless electric power is the unit of measure for consumption.

(2) Comparison. Suitable when information on the physical properties of the compared facility and estimated facilities are readily obtained.

(3) Consumption Tables. Design tables contained in the 1979 Handbook of Air Conditioning, Heating and Ventilation, by Eugene Stomper, Editor, Industrial Press Inc. Refer to Chapter 2, Table 1, Design Data for Commercial Air Conditioning, and Table 2, Cooling Load Calculations.

(4) Engineering Analysis. Collect data and follow the calculation method in Chapter 26, Air Conditioning Cooling Load, of the 1985 American Society of Heating, Refrigeration and Air Conditioning Engineers Handbook of Fundamentals. This chapter covers calculating space cooling loads; general procedures; and simplified procedures for residential calculations.

g. Sewage. Consumption is usually measured in thousands of gallons (Kgal). Use a percentage of water consumption. Percentages used may vary from 70 to 90 depending on the type of facility and the local estimate of the amount of incoming water not reaching sewage system.

h. Fuel Oil. Usually measured in gallons (Gal), but may be measured in liters (L). Methods of delivery will determine if there are line losses and what percentage to use.

i. Ice. Consumption is usually measured in pounds (Lb). Always weigh for delivery.

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j. Garbage or Refuse Disposal. Consumption measured in the most accurate local method; number of pick-ups, tons, cubic yards, or number of containers.

k. Vending Machines. Use the Army and Air Force Exchange System (AAFES) figures referenced in Appendix B.

Chapter V - Rate Computations

5-1. Data Required. Rate computations are based on prior year cost data described in Chapter III for annual computation or notification of changes in cost by a supplier for an intermediate period or by calculating charges and MCA cost data for facilities in each type of service. If there have been no additions to the MCA base, the calculations for the prior year are acceptable.

5-2. Rate Calculations. Appendix C contains a suggested method of rate computation with format sheets for the various types of services. This method can be used for manual or computer preparation.

Chapter VI - Meter Reading.

6-1. Frequency. Monthly meter readings are preferred for purchasers of large quantities of utility services. Variations from monthly readings are acceptable for small quantities or meters located at remote sites.

6-2. Procedures. Careful and accurate adherence to manufacturer instructions or guidelines is required. Some meter readings must be multiplied by a correction factor, usually on the dial face.

6-3. Forms. Computer generated forms or meter reading books are used and retained for the official record. Completed forms and books should show as a minimum the following:

- a. Type of utility meter, identification number and location.
- b. Meter multiplier.
- c. Prior reading date and meter reading.
- d. Present reading date and meter reading.
- e. Number of days between readings and the consumption in that period.
- f. Average consumption per day between reading dates.
- g. Units (KWH, Cubic Feet, Gallons, etc).
- h. Remarks (damage to meter, suspected tampering, etc).
- h. Name of meter reader.

Chapter VII - Billing.

7.1 Preparation. The amount charged is determined by the amount of consumption as determined in Chapter IV, the rate class as prescribed in Appendix B, and rate calculation as determined by procedures in Appendix C. Bills are usually prepared monthly, but the billing period may be varied when monthly amounts do not justify such a frequency.

7-2. Adjustments. Billing adjustments are required when:

a. Significant changes to consumption occur in non-metered facilities, such as an increase or decrease in purchaser's operations or equipment, consumption amounts should be re-computed.

b. Whenever a utility supplier to the Army places a new rate into effect, the affected rates should be recalculated and billed according to the sales contract terms.

7-3. Annual Review. The Utilities Sales/Services Officer will:

a. Review annually the eligibility of each purchaser using the latest issues of Army Regulations referenced in notes to Appendix B.

b. Evaluate the need to recompute consumption quantity for non metered service.

c. Prepare new rates using format sheets in Appendix C.

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APPENDIX B

CATEGORIES OF FACILITIES, ACTIVITIES AND INDIVIDUALS AND APPLICABLE RATE CLASSES FOR UTILITIES SERVICES

DIRECTORATE OF ARMY POWER PROCUREMENT
US ARMY ENGINEERING AND HOUSING SUPPORT CENTER
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Categories of Facilities, Activities and Individuals
and Applicable Rate Classes for Utilities Services

Categories	Applicable Rate Classes			
	Without Charge	With Charge		
		Rate A	Rate B	LPR ¹
ARMY MWR Category A Category B Category D	X X	X ^{2&3}		
Commissaries		X ⁴		
Family Housing		X ⁵		
Other DOD Activities		X		
Federal Non-DOD Activities		X		
State & Local Government on Post			X	
PRIVATE ORGANIZATIONS (POs) ON POST Banks Credit Unions American National Red Cross United Services Organization United Seamen's Service Labor Organizations Assoc. of Superv. & Managers Civil Air Patrol Army Emergency Relief Other Type 1 and all Types 2 & 3 POs All other Lessees on Post	X ⁸ X ⁹ X ¹⁴		X ⁶ X ⁷ X ¹⁰ X ¹¹ X ¹² X ¹³ X ¹⁵ X ¹⁶	
Contractors: MCA, OMA, RDT&E			X ¹⁷	
Vending Machines (Not a Category)			X ¹⁸	
Electricity from Alternate Energy and Cogeneration			X	
OFF POST Schools and Colleges Commercial Business Title VII Housing Rental Quarters All other Off Post Customers				X X X X X

NOTES FOR APPENDIX B: (Referenced documents should be read for full context and meaning when their provisions apply.)

1. In all cases where Local Prevailing Rate (LPR) is prescribed as the applicable rate, compare Rate B to the LPR. If Rate B is higher than LPR, use Rate B (AR 420-41).

2. AR 215-1, The Administration of Army Morale, Welfare and Recreation Activities and Non-Appropriated Fund Instrumentalities, 10 October 1990, Issue Number 16, has made some exceptions in the areas of common support and common services.

a. Exception: Common Support. Paragraph 4-1. b. ... If the sum of all common support (communications, utilities, custodial and janitorial services, personnel and procurement services, accounting and other common types support) is less than \$2500 per year and does not warrant the expense of proration and billing there will be no charge.

b. Exception: Common Services. Appendix C of AR 215-1, paragraph 12.h. Common Services. Services of protective or sanitary nature normally supplied as a command function. Such services include: fire protection....; pest control; sewage disposal; trash and garbage removal; snow removal... Authorized (without charge) for all costs associated with protecting health and safety...

c. Appendix C of AR 215-1, Paragraph 7 - CONUS temporary guest facilities are not authorized free utilities. OCONUS is authorized free utilities.

d. For golf courses where water used for ground maintenance is supplied from:

(1) Excess water that is generated and/or stored for fire prevention and suppression purposes;

(2) Non-potable water and excess potable water that must be generated to maintain safe operating conditions of a water treatment facility; or

(3) Water from government owned wells that is not treated;

the applicable rate shall be the actual pumping costs rather than the standard rate outlined in AR 420-41. The sales agreement must be updated to reflect any special circumstances. Copy of written agreement or modifications thereto shall be provided to the corresponding Army Power Procurement Officer Representative. Clear documentation and detailed calculation procedure must accompany the requests for approval.

3. AR 210-25, Vending Facility Program for the Blind on Federal Property, establishes that the operation of cafeterias and snack bars by the blind on

Federal Property shall be subject to payment of utilities and telephone services to be reimbursed by the State licensing agency. The DOD Component will provide support and bill the State licensing agency.

4. AR 30-19, Army Commissary Store Operating Policies, and USC 10-2484. With charge in CONUS; without charge in Alaska, Hawaii, and outside the Continental United States.

5. Family Housing funded BMAR is excluded from rate calculations. Rate A is modified for Family Housing. See Appendix C, Family Housing Rate sheet.

6. AR210-135, Banks and Credit Unions on Army Installations.

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2-4. Use of Space, Logistical Support, and Military Real Property.

a. (1) Nonself-sustaining"The Director of Finance and Accounting, OASA (FM) authorizes the degree of logistical support and classifies the bank as nonself-sustaining when the bank profit is below 7 percent of gross expenses for four consecutive quarters.

(2) Self-sustaining ... reimbursement will be required for support when profit and loss statements of the bank show a profit of 10 percent or more for four consecutive quarters.

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3-3. Logistical Support.

a. Overseas Military Bank Facilities (MBF) operated under contract.

(1) Installation or community commanders will provide logistical banking support. Such support normally includes- (g). Utilities, Custodial and janitorial services... "Utilities are defined as electricity, heat, water, sewage and garbage disposal."

7. AR210-135, Banks and Credit Unions on Army Installations.

CONUS

4-4. Logistical Support.

When available, janitorial services, utilities (such as air-conditioning, electricity, gas, water, and sewage) shall be furnished without charge. If the membership fails to meet 95% criteria (95% of members composed of military personnel or federal employees) then utility services must be reimbursed.

OCONUS

Section IV. Overseas Credit Unions.

4-18. b.... janitorial services, utilities (such as air-conditioning, electricity, gas, water, and sewage)... are furnished at no cost to the credit union occupying free space in a Government building. If Credit Union fails to meet 95% criteria (95% of members composed of military personnel or federal employees) then utility services must be reimbursed...

8. AR 930-5, American National Red Cross Service Program and Army Utilization.

3-3 Utilities Services. Utilities services will be furnished at Government expense in buildings owned by, or leased to, the Army which are occupied as office space by representatives of the Red Cross, and in buildings owned by the Red Cross on Government owned land, subject to such limitations may be prescribed by the appropriate military commander.

9. AR 930-1, Army Use of USO Services.

Section III. 9. ...may be granted limited logistical support according to AR 210-1, Chapter 4.

10. AR 700-83, Army Support of United Seamen's Service.

11. Federal Personnel Manual (FPM), Chapter 711. (For Labor organizations subject to Title 5, USC, chapter 71).

12. Civilian Personnel Regulation (CPR) 251 and AR 1-210.

13. AFR 46-6, Support for Civil Air Patrols.

14. AR 930-4, Army Emergency Relief.

15. AR 210-1, Private Organizations on Department of the Army Installation. Section III 4-10 Utilities. All POs will reimburse the installation for utilities except when not required ...

Installation commander may waive or reduce utility rates for nonprofit POs under provisions of AR 37-60. Paragraphs 9-6 and 9-8.

16. AR 420-41, Lessees of facilities used by lessees for private commercial purposes.

17. MCA, OMA, RDT&E Contractors: The contract document controls whether or not utilities are furnished without charge or with charge Rate A or Rate B).

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For fixed-price construction, fixed-price dismantling, demolition, improvement contracts, look for clauses from Federal Acquisition Regulations 36.514 and 52.236-14. Clauses 52.236-14 a. "... paid for by the Contractor at prevailing rates charged to the Government or where produced by the Government, at reasonable rates determined by the contracting officer." This allows no mark up for O&M of the distribution system.

18. Vending machines, equipment and appliances connected to the installation system and operated for private gain. Rate charged depends on Purchaser category. For example an AAFES vending machine could be Category C at either Rate A for CONUS installations or without charge for OCONUS installations. The electrical consumption of typical vending machines is provided by the Energy Management Manual ESM-36-1, July 1983, published by the Headquarters Army and Air Force Exchange Service, Dallas, Texas 75222.

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APPENDIX C

RATE CALCULATION FORMATS WITH INSTRUCTIONS FOR COMPLETION

DIRECTORATE OF ARMY POWER PROCUREMENT
US ARMY ENGINEERING AND HOUSING SUPPORT CENTER
FORT BELVOIR, VIRGINIA 22060-5516

GENERAL DIRECTIONS FOR COMPLETION OF FORMATS.

1. Original and one copy of the formats for each of the applicable services should be prepared. Include work sheets.
2. The formats may be revised to cover any unique circumstances at the Installation. Use the section titled "Explanation of any Variations" to explain the need for revision of format.
3. Include a brief explanation of any items experiencing a drastic change from the previous year's calculation. For example, a \$1.0 million dollar increase in the electric system capital cost should be explained in the section "Explanation of any Variations". A short note will be sufficient. Example: Item IV.1, Capital cost increased due to new substation.
4. Be sure to include a copy of the local prevailing rate. If none is available, indicate this in the item "Local Prevailing Rate".
5. Mid-year rate changes should be passed through to customers by submitting a new calculation for approval. The decision to calculate a new rate should be based on the impact of the supplier's rate change. As a general rule, the rate should be recalculated when the change in revenue is offset by the administrative cost of implementing the revised rate.
6. Suggestions to improve the formats are requested.

Format sheets are attached for:

PAGE NO.

Sales Rate Summary	C-3
Family Housing Rates	C-4
Electricity	C-6
Water	C-9
Sewage	C-13
Refuse Collected/Disposed	C-17
Natural Gas	C-19
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Space Cooling (Per Square Foot)	C-30
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Space Heating (Per Square Foot) alternate 2	C-34
Space Heating (Per MCF)	C-36
Space Heating (Per MBTU)	C-38
Space Heating Based on Coal Consumption	C-40
Space Heating Based on Wood Pellet Consumption	C-42

SALES RATE SUMMARY

Installation: _____

Date: _____

Current Rates for FY _____

Current Rates for FY _____

	A	H	B	A	H	B
Electric (\$/KWh)	_____	_____	_____	_____	_____	_____
Water (\$/KGal)	_____	_____	_____	_____	_____	_____
Sewage (\$/KGal)	_____	_____	_____	_____	_____	_____
Nat Gas (\$/Therm)						
Firm	_____	_____	_____	_____	_____	_____
Interruptible	_____	N/A	_____	_____	N/A	_____
Refuse (\$/CuYd)	_____	_____	_____	_____	_____	_____
LP Gas (\$/Gal)	_____	_____	_____	_____	_____	_____
#__Fuel Oil (\$/Gal)	_____	_____	_____	_____	_____	_____
Steam (\$/KLb)	_____	_____	_____	_____	_____	_____
Space Htg (\$/SF/Mo)	_____	_____	_____	_____	_____	_____
Space Htg (\$/MCF)	_____	_____	_____	_____	_____	_____
Space Htg (\$/MBTU)	_____	_____	_____	_____	_____	_____
Space Htg (\$/Ton)						
Using Coal	_____	_____	_____	_____	_____	_____
Space Htg (\$/Ton)						
Using Wood Pellet	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

The monthly Fuel Adjustment is added to Base Rates.

A = Rate A

B = Rate B

H = Family Housing Rate from 'Family Housing Rates' Sheet.

Prepared by: _____

FAMILY HOUSING RATES

Installation: _____ Period From: _____ to _____

Calculations for Fiscal Year: _____ Prepared By: _____

I. COST OF MAINTENANCE (SEE NOTE 1):

INSTRUCTIONS:

	ELEC	WATER	SEWAGE	NAT GAS	
1. Normal Maintenance	\$ _____	\$ _____	\$ _____	\$ _____	Input
2. Abnormal Maint.	\$ _____	\$ _____	\$ _____	\$ _____	Input
3. Abnormal Maint. Amortization	\$ _____	\$ _____	\$ _____	\$ _____	I.2 / 5
4. Abnormal Maint. from Previous Years	\$ _____	\$ _____	\$ _____	\$ _____	Input
5. Reimbursed Maint. (See Note 2)	\$ _____	\$ _____	\$ _____	\$ _____	Input
6. Total Maintenance	\$ _____	\$ _____	\$ _____	\$ _____	I.1+I.3+I.4-I.5
7. Quantity Consumed	\$ _____	\$ _____	\$ _____	\$ _____	SEE NOTE 3
8. Unit Cost of Maintenance	\$ _____ \$ per KWhr	\$ _____ \$ per KGal	\$ _____ \$ per KGal	\$ _____ \$ per Therm	I.6 / I.7

II. COST OF OPERATION/GENERATION/PURCHASE:

	Elec \$/KWh	Water \$/KGal	Sewage \$/KGal	Nat Gas \$/Therm	
1. Unit Cost	_____	_____	_____	_____	SEE NOTE 4

III. UNIT RATE FOR FAMILY HOUSING = RATE H:

Unit Costs	Elec* \$ per KWh	Water \$ per KGal	Sewage \$ per KGal	Nat Gas \$ per Therm	
1. Operation	_____	_____	_____	_____	II.1
2. Maintenance	_____	_____	_____	_____	I.8
3. Rate H	_____	_____	_____	_____	III.1+III.2

NOTES:

1. The procedures for calculation of the systems maintenance to be charged family housing are the same as those used in all other calculations, **EXCEPT THE COST OF THE BMR PROJECTS ARE TO BE SUBTRACTED OUT.** This applies to both normal and abnormal maintenance.

2. This line refers strictly to MAINTENANCE reimbursements.

3. Extract the following items from the previous calculations and insert on appropriate lines.

Electrical	= I.4 from Electrical Calculations
Water	= I.6 from Water Calculations
Sewage	= I.5 from Sewage Calculations
Natural Gas	= I.3 from Natural Gas Calculations

4. Extract the following items from the previous calculations and insert on the appropriate lines.

Electrical	= II.6 from Electrical Calculations
Water	= II.7 from Water Calculations
Sewage	= II.7 from Sewage Calculations
Natural Gas	= II.1.d from Natural Gas Calculations

EXPLANATION OF VARIANCES:

* The fuel adjustment must be added to Rate H each month in order to obtain the final billing rate.

ELECTRICITY

Initial [] Within FY Rate Change []

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared By: _____

INSTRUCTIONS:

I. CONSUMPTION:

1. Purchase:

a. Actual Purchased Quantity	_____	KWh		Input
b. Estimated New Requirement	_____	KWh		Input
c. Total Purchase Quantity	_____	KWh		I.1.a + I.1.b

2. Generation:

a. Actual Generated Quantity	_____	KWh		Input
b. Estimated New Requirement	_____	KWh		Input
c. Total Generation Quantity	_____	KWh		I.2.a + I.2.b

3. Estimated Total Usage

_____	KWh		I.1.c + I.2.c
-------	-----	--	---------------

4. Percent Losses

_____	%		Input (NOTE 1)
-------	---	--	----------------

5. Losses

_____	KWh		I.3 X I.4 / 100
-------	-----	--	-----------------

6. Estimated Total Consumption

_____	KWh		I.3 - I.5
-------	-----	--	-----------

II. COST OF OPERATION:

1. Purchase Cost:

a. Initial Submission:

(1) Actual Purchased Cost	\$ _____		Input
(2) Estimated New Requirement Cost	\$ _____		I.1.b X II.1.a(1) / I.1.a
(3) Total Purchase Cost	\$ _____		II.1.a(1) + II.1.a(2)

b. Within FY Rate Change Submission:

(1) Rate Change Effective Date	_____		Input
(2) New Rate (Recalculated) Purchase Cost	\$ _____		Input

ELECTRICITY (CONT' D)

		INSTRUCTIONS:
2. Generation Cost:		
a. Actual Generated Cost	\$ _____	Input
b. Estimated New Requirement Cost	\$ _____	$I.2.b \times [II.2.a / I.2.a]$
c. Total Generation Cost	\$ _____	$II.2.a + II.2.b$
3. Estimated Total Cost of Operation	\$ _____	$[II.1.a(3) \text{ or } II.1.b(2)] +$ $II.2.c$ [Use II.1. a(3) if II.1. b(2) = 0, otherwise use II.1. b(2)]
4. Unit Cost of Operation	\$ _____ per KWh	$II.3 / I.6$
 III. COST OF MAINTENANCE:		
1. Normal Maintenance Cost	\$ _____	Input
2. Estimated New Requirement Maintenance Cost	\$ _____	$[I.1.b + I.2.b] \times III.1 /$ $[I.1.a + I.2.a]$
3. Abnormal Maintenance Cost	\$ _____	Input
4. Abnormal Maintenance Cost Amortization	\$ _____	$III.3 / 5$ (NOTE 2)
5. Abnormal Maintenance Cost Amortization Carry-over from Previous Years	\$ _____	Input
6. Estimated Total Cost of Maintenance	\$ _____	$III.1 + III.2 + III.4 +$ $III.5$
7. Unit Cost of Maintenance	\$ _____ per KWh	$III.6 / I.6$
 IV. COST OF CAPITAL:		
1. Present Acquisition Cost (From Real Property Record)	\$ _____	Input
2. Estimated New Facilities Acquisition Cost	\$ _____	Input
3. Annual Charge	\$ _____	$[IV.1 + IV.2] \times 0.1$ (NOTE 3)
4. Estimated Annual Peak Demand in KW	_____ KW	Input (NOTE 4)
5. System Capacity	_____ KWh per year	$IV.4 \times 24 \times 365$
6. Unit Cost of Capital	\$ _____ per KWh	$IV.3 / IV.5$

ELECTRICITY (CONT' D)

			INSTRUCTIONS:
V. RATE SUMMARY:			
1. Unit Cost of Operation	\$ _____	per KWh	II.4
2. Unit Cost of Maintenance	\$ _____	per KWh	III.7
3. Rate A	\$ _____	per KWh	V.1 + V.2
4. Rate A	\$ _____	per KWh	V.3
5. Unit Cost of Capital	\$ _____	per KWh	IV.6
6. Subtotal	\$ _____	per KWh	V.4 + V.5
7. Administrative Overhead	\$ _____	per KWh	V.6 X 0.03
8. Rate B	\$ _____	per KWh	V.6 + V.7
9. Rate for Pumping (SEE NOTE 5)	\$ _____	per KWh	V.3 (RATE A)

NOTES:

1. The estimated loss percentage may be prorated at 1% for substation, 2% for lines, and 2% for distribution transformers, for a system loss factor of 5%. These percentages may be revised to more closely reflect your system.
2. High cost nonrecurring maintenance costs during the year could result in abnormal variation in the sales rate. This may be avoided by spreading the cost over a period of five years. One fifth of the cost is included each year.
3. The 10% factor in calculating the annual capital charge is mandatory.
4. When the annual peak demand is appreciably less than the system capacity (50%), you should consider using the substation capacity to determine the system capacity. Any such variation should be explained as should any changes in the system cost obtained from the property records.
5. This rate is used in later calculations for determining the cost of electricity for pumping.

DISCUSSIONS:

Items II.1(a) & II.1(b) must be completed when the supplier implements a rate change during the 12 months period which these calculations are applicable.

New requirement operation and maintenance costs are based on the operation and maintenance of existing facilities. If new facilities are added to fulfill the installation requirement, then, the estimated costs of operating and maintaining the new facilities must be added to the formulae.

EXPLANATION OF ANY VARIATIONS:

LOCAL PREVAILING RATE: Attach one copy when changes have occurred during the base period.

WATER

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared By: _____

I. QUANTITY CONSUMED:

INSTRUCTIONS:

1. Quantity Purchased (From Bills)	_____	Kgal		Input
2. Quantity Produced	_____	KGal		Input
3. Subtotal	_____	KGal		I.1 + I.2
4. System Loss % (SEE NOTE 1)	_____	%		Input
5. Losses	_____	KGal		I.3 X I.4 / 100
6. Quantity Used	_____	KGal		I.3 - I.5

II. COST OF PURCHASE/PRODUCTION:

1. Purchase Cost (Actual Bills)	\$ _____		Input
---------------------------------	----------	--	-------

Items 2 and 3 must be completed when a rate change has occurred during the 12 months covered by these calculations. Calculate what the monthly billings would have been at the current rate and enter the annual cost in Item 3. Attach a copy of the current rate schedule and your work sheet.

2. Date of last Rate change	_____		Input
3. Recalculated Purchase Cost	\$ _____		Input
4. Cost of Production (SEE NOTE 2)	\$ _____		Input
5. Power for Pumping	\$ _____		III.3
6. Total Cost Purchase/Production	\$ _____		(II.1 or II.3) + II.4 + II.5 (Use II.1 if II.3 = 0, otherwise use II.3)
7. Unit Cost for Purchase/Production	\$ _____		II.6 / I.6

III. COST OF POWER FOR PUMPING:

INSTRUCTIONS:

1. Electric Consumption			
a. Metered	_____	KW hr	Input
b. Unmetered	_____	KW hr	Total of III.4 for all pumps
c. Total	_____	KW hr	III.1.a + III.1.b
2. Pumping Rate	\$ _____	per KW hr	V.II from Electric Calculations.
3. Cost of Pumping	\$ _____		III.c X III.2

WATER (CONT'D)

4. Estimated Usage for Unmetered Pumps:

INSTRUCTIONS:

Pump No. ____/Location ____/____	____/____	____/____	____/____		
a. Average Pumping Head	____ ft	____ ft	____ ft		Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm		Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs		Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh		III.4.a X III.4.b X III.4.c X 0.00029
Pump No. ____/Location ____/____	____/____	____/____	____/____		
a. Average Pumping Head	____ ft	____ ft	____ ft		Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm		Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs		Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh		III.4.a X III.4.b X III.4.c X 0.00029
Pump No. ____/Location ____/____	____/____	____/____	____/____		
a. Average Pumping Head	____ ft	____ ft	____ ft		Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm		Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs		Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh		III.4.a X III.4.b X III.4.c X 0.00029
Pump No. ____/Location ____/____	____/____	____/____	____/____		
a. Average Pumping Head	____ ft	____ ft	____ ft		Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm		Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs		Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh		III.4.a X III.4.b X III.4.c X 0.00029
Pump No. ____/Location ____/____	____/____	____/____	____/____		
a. Average Pumping Head	____ ft	____ ft	____ ft		Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm		Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs		Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh		III.4.a X III.4.b X III.4.c X 0.00029
Pump No. ____/Location ____/____	____/____	____/____	____/____		
a. Average Pumping Head	____ ft	____ ft	____ ft		Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm		Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs		Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh		III.4.a X III.4.b X III.4.c X 0.00029

Note:

Efficiency = 65% HP = 0.746 Kw

KWh = (Pumping Rate X Avg Pumping Head X Annual Hours of use X 0.746) divided by (3960 X 0.65)
= (Pumping Rate X Avg Pumping Head X Annual Hours of use) X 0.00029

WATER (CONT'D)

IV. COST OF MAINTENANCE:			INSTRUCTIONS:
1. Normal Maintenance	\$ _____		Input
2. Abnormal Maintenance (SEE NOTE 3)	\$ _____		Input
3. Abnormal Amortization	\$ _____		IV.2 / 5
4. Amortization Maintenance Carry-over from previous years.	\$ _____		Input
5. Reimbursed Maintenance	\$ _____		Input
6. Net Maintenance Cost	\$ _____		IV.1 + IV.3 + IV.4 - IV.5
7. Unit Cost Maintenance	\$ _____	Per KGal	IV.6 / I.6
V. COST OF CAPITAL:			
1. Acquisition Cost (From Real Property Record)	\$ _____		Input
2. Annual Charge (SEE NOTE 4)	\$ _____		V.1 X 0.1
3. System Capacity	_____	Gal. per day	Input
4. Annual Capacity	_____	KGal per yr	V.3 X 365 / 1,000
5. Unit Cost of Capital	\$ _____	per KGal	V.2 / V.4
VI. RATE SUMMARY:			
1. Unit Cost of Purchase/Production	\$ _____	per KGal	II.7
2. Unit Cost of Maintenance	\$ _____	per KGal	IV.7
3. Rate A	\$ _____	per KGal	VI.1 + VI.2
4. Rate A.	\$ _____	per KGal	VI.3
5. Unit Cost of Capital	\$ _____	per KGal	V.5
6. Subtotal	\$ _____	per KGal	VI.4 + VI.5
7. Administrative Overhead	\$ _____	per KGal	VI.6 X 0.03
8. Rate B.	\$ _____	per KGal	VI.6 + VI.7

WATER (CONT'D)

NOTES:

1. Normal losses may be estimated at 5%. This percentage may be revised to more closely reflect your system.
2. Include all labor, material, and supply costs (excluding electricity) used in operating the water facilities (wells, treatment plants, etc.).
3. High cost nonrecurring maintenance costs during the year could result in abnormal variation in the sales rate. This may be avoided by spreading the cost over a period of five years. One fifth of the cost is included each year. Use a 25% increase in Rate A as a guide in making decisions to amortize.
4. The 10% factor in calculating the annual capital charge is mandatory.

EXPLANATION OF ANY VARIATIONS:

LOCAL PREVAILING RATE: Attach one copy when changes have occurred during the base period.

SEWAGE

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared By: _____

I. QUANTITY GENERATED: (SEE NOTE 1)

| INSTRUCTIONS:

1. Total Water Used	_____	KGal	I.6 from Water Calculations
2. Sewage as % of water	_____	KGal	Input
3. Actual Generation	_____	KGal	Input
4. Infiltration and Inflow	_____	KGal	Input
5. Quantity Used	_____	KGal	I.1 X I.2 / 100 or I.3 - I.4

II. COST OF PURCHASE/TREATMENT:

1. Purchase Cost (Actual Bills)	\$ _____	Input
---------------------------------	----------	-------

Items 2 and 3 must be completed when a rate change has occurred during the 12 months covered by these calculations. Calculate what the monthly billings would have been at the current rate and enter the annual cost in Item 3. Attach a copy of the current rate schedule and your work sheet.

2. Date of last Rate change	_____	Input
3. Recalculated Purchase Cost	\$ _____	Input
4. Cost of Treatment (SEE NOTE 2)	\$ _____	Input
5. Power for Pumping	\$ _____	III.3
6. Total Cost Purchase/Treatment	\$ _____	(II.1 or II.3) + II.4 + II.5
		(Use II.1 if II.3 = 0,
		otherwise use II.3)
7. Unit Cost for Purchase/Production	\$ _____ Per KGal	II.6 / I.5

III. COST OF POWER FOR PUMPING:

1. Electric Consumption			
a. Metered	_____	KW hr	Input
b. Unmetered	_____	KW hr	Total of III.4 for all pumps
c. Total	_____	KW hr	III.1.a + III.1.b
2. Pumping Rate	\$ _____	per KW hr	V.II from Electric
			Calculations.
3. Cost of Pumping	\$ _____		III.c X III.2

SEWAGE (CONT'D)

4. Estimated Usage for Unmetered Pumps:

INSTRUCTIONS:

Pump No. ____/Location ____/____	____/____	____/____	____/____	
a. Average Pumping Head	____ ft	____ ft	____ ft	Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm	Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs	Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh	III.4.a X III.4.b X III.4.c X 0.00029
Pump No. ____/Location ____/____	____/____	____/____	____/____	
a. Average Pumping Head	____ ft	____ ft	____ ft	Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm	Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs	Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh	III.4.a X III.4.b X III.4.c X 0.00029
Pump No. ____/Location ____/____	____/____	____/____	____/____	
a. Average Pumping Head	____ ft	____ ft	____ ft	Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm	Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs	Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh	III.4.a X III.4.b X III.4.c X 0.00029
Pump No. ____/Location ____/____	____/____	____/____	____/____	
a. Average Pumping Head	____ ft	____ ft	____ ft	Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm	Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs	Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh	III.4.a X III.4.b X III.4.c X 0.00029
Pump No. ____/Location ____/____	____/____	____/____	____/____	
a. Average Pumping Head	____ ft	____ ft	____ ft	Input
b. Pumping Rate	____ Gpm	____ Gpm	____ Gpm	Input
c. Annual Hours of Use	____ Hrs	____ Hrs	____ Hrs	Input
d. Total KWh Consumed	____ KWh	____ KWh	____ KWh	III.4.a X III.4.b X III.4.c X 0.00029

Note:

Efficiency = 65% HP = 0.746 Kw

KWh = (Pumping Rate X Avg Pumping Head X Annual Hours of use X 0.746) divided by (3960 X 0.65)
= (Pumping Rate X Avg Pumping Head X Annual Hours of use) X 0.00029

SEWAGE (CONT'D)

IV. COST OF MAINTENANCE:			INSTRUCTIONS:
1. Normal Maintenance	\$ _____		Input
2. Abnormal Maintenance (SEE NOTE 3)	\$ _____		Input
3. Abnormal Amortization	\$ _____		IV.2 / 5
4. Amortization Maintenance Carry-over from previous years.	\$ _____		Input
5. Reimbursed Maintenance	\$ _____		Input
6. Net Maintenance Cost	\$ _____		IV.1 + IV.3 + IV.4 - IV.5
7. Unit Cost Maintenance	\$ _____	Per KGal	IV.6 / I.5
V. COST OF CAPITAL:			
1. Acquisition Cost (From Real Property Record)	\$ _____		Input
2. Annual Charge (SEE NOTE 4)	\$ _____		V.1 X 0.1
3. System Capacity	_____	Gal. per day	Input
4. Annual Capacity	_____	KGal per yr	V.3 X 365 / 1,000
5. Unit Cost of Capital	\$ _____	per KGal	V.2 / V.4
VI. RATE SUMMARY:			
1. Unit Cost of Purchase/Production	\$ _____	per KGal	II.7
2. Unit Cost of Maintenance	\$ _____	per KGal	IV.7
3. Rate A	\$ _____	per KGal	VI.1 + VI.2
4. Rate A.	\$ _____	per KGal	VI.3
5. Unit Cost of Capital	\$ _____	per KGal	V.5
6. Subtotal	\$ _____	per KGal	VI.4 + VI.5
7. Administrative Overhead	\$ _____	per KGal	VI.6 X 0.03
8. Rate B.	\$ _____	per KGal	VI.6 + VI.7

SEWAGE (CONT'D)

NOTES:

1. The actual sewage volume generated less the infiltration estimates should be used if known. Otherwise an estimate based on percent of the total quantity of water may be used. Normally this is 70%, however this may be revised to more closely reflect your system.
2. Include all labor, material, and supply costs (excluding electricity) used in operating the sewage treatment, facilities, treatment plan, etc.).
3. High cost nonrecurring maintenance costs during the year could result in abnormal variation in the sales rate. This may be avoided by spreading the cost over a period of five years. One fifth of the cost is included each year. Use a 25% increase in Rate A as a guide in making decisions to amortize.
4. The 10% factor in calculating the annual capital charge is mandatory.

EXPLANATION OF ANY VARIATIONS:

LOCAL PREVAILING RATE: Attach one copy when changes have occurred during the base period.

REFUSE COLLECTION/DISPOSAL

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared By: _____

I. QUANTITY COLLECTED/DISPOSED:

INSTRUCTIONS:

	Collection	Disposal	
1. DEH Personnel	_____ CuYd	_____ CuYd	Input
2. Contract	_____ CuYd	_____ CuYd	Input
3. Troop/Self-Help (SEE NOTE 1)	_____ CuYd	_____ CuYd	Input
4. Totals	_____ CuYd	_____ CuYd	I.1 + I.2 + I.3

II. COST OF COLLECTION/DISPOSAL:

	Collection	Disposal	
1. Operations & Maint.	\$ _____	\$ _____	Input
2. Labor/Supervision	\$ _____	\$ _____	Input
3. Equip. Rental (SEE NOTE 2)	\$ _____	\$ _____	Input
4. Contract	\$ _____	\$ _____	Input
5. Other	\$ _____	\$ _____	Input
6. Subtotal	\$ _____	\$ _____	II.1 + II.2 + II.3 + II.4 + II.5
7. Maintenance Reimbursement	\$ _____	\$ _____	Input
8. Total Cost	\$ _____	\$ _____	II.6 - II.7
9. Unit Cost Coll/Disp	\$ _____	\$ _____	II.8 / I.4

III. COST OF CAPITAL: (SEE NOTE 3)

	Collection	Disposal	
1. Acquisition Cost	\$ _____	\$ _____	Input
2. Annual Charge	\$ _____	\$ _____	III.1 X 0.1
3. System Capacity	_____ Cy/Day	_____ Cy/Day	Input
4. Annual System Capacity	_____ Cy/Yr	_____ Cy/Yr	III.3 X 365
5. Unit Cost of Capital	\$ _____ /CuYd	\$ _____ /CuYd	III.2 / III.4

REFUSE COLLECTION/DISPOSAL (CONT'D)

V. RATE SUMMARY:			INSTRUCTIONS
	Collection	Disposal	
1. Rate A	\$ _____/CuYd	\$ _____/CuYd	II.9
2. Rate A	\$ _____/CuYd	\$ _____/CuYd	II.9
3. Unit Cost of Capital	\$ _____/CuYd	\$ _____/CuYd	III.5
4. Subtotal	\$ _____/CuYd	\$ _____/CuYd	IV.2 + IV.3
5. Administration/Overhead	\$ _____/CuYd	\$ _____/CuYd	IV.4 X 0.03
6. Rate B	\$ _____/CuYd	\$ _____/CuYd	IV.4 + IV.5
7. Combined Rates (Coll & Disp)			
8. Rate A	\$ _____	per CuYd	IV.1 (Coll) + IV.1 (Disp)
9. Rate B	\$ _____	per CuYd	IV.6 (Coll) + IV.6 (Disp)

NOTES:

1. The cost of refuse collections by troops and self help personnel is not charged to the DEH. Disposal is normally accomplished by the DEH or by contract. The quantity should be included on this disposal line provided it is not included in either line 1 or 2.
2. Mobile equipment rental costs are determined from Tables 2-1 and 2-2 of AR 415-35. Add the unit costs of equipment maintenance and operation to the unit cost of depreciation and multiply by the number of operating hours. Collection equipment includes trash trucks and pick-up; disposal equipment includes the dozer and shovel at the landfill.
3. Acquisition cost includes the costs of collection containers, pads, sanitary landfill facilities, etc., but excludes mobile equipment which is covered by the equipment entry. The 10% factor in calculating the annual capital charge is mandatory.

EXPLANATION OF ANY VARIATIONS:

LOCAL PREVAILING RATE: Attach one copy when changes have occurred during the base period.

NATURAL GAS

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared by: _____

I. QUANTITY CONSUMED:

INSTRUCTIONS

- | | | | |
|-------------------------------------|-------|--------------|------------------------------|
| 1. Firm | | | |
| a. Quantity Purchased (From Bills) | _____ | Therms | Input (SEE NOTE 1) |
| b. Percent Losses (SEE NOTE 2) | _____ | % | Input |
| c. Losses | _____ | Therms | $I.1.a \times I.1.b / 100$ |
| d. Quantity Used | _____ | Therms | $I.1.a \text{ minus } I.1.c$ |
| | | | |
| 2. Interruptible | | | |
| a. Quantity (from Bills) | _____ | Therms | Input (SEE NOTE 1) |
| b. Percent Losses (SEE NOTE 2) | _____ | % | Input |
| c. Losses | _____ | Therms | $I.2.a \times I.2.b / 100$ |
| d. Quantity Used | _____ | Therms | $I.2.a \text{ minus } I.2.c$ |
| | | | |
| 3. Total Gas (Firm + Interruptible) | _____ | Therms | $I.1.d + I.2.d$ |
| 4. Average BTU Content | _____ | BTU per CuFt | Input |
| | | | |

II. COST OF PURCHASE:

Items 1b & c and 2b & c must be completed when a rate change has occurred during the 12 months covered by these calculations. Calculate what the monthly billings would have been at the current rate and enter the annual cost in item c. Attach a copy of the current rate schedule and your work sheet.

- | | | | |
|---------------------------------|----------|-----------|--------------------------------------|
| 1. Firm | | | |
| a. Purchase Cost (Actual Bills) | \$ _____ | | Input |
| | | | |
| b. Date of Last Rate Change | _____ | | Input |
| c. Recalculated Cost | \$ _____ | | Input |
| | | | |
| d. Unit Cost of Purchase (Firm) | \$ _____ | Per Therm | $II.1.a \text{ or } II.1.c / I.1.d.$ |
| | | | Use II.1.a if $II.1.c = 0$, |
| | | | otherwise use II.1.c |

NATURAL GAS (CONT'D)

			INSTRUCTIONS
2. Interruptible			
a. Purchase Cost (Actual Bills)	\$ _____		
b. Date of Last Rate Change	_____		Input
c. Recalculated Cost	\$ _____		Input
d. Unit Cost of Purchase (Interr.)	\$ _____ per Therm		II.2.a or II.2.c /I.2.d.
			Use II.2.a if II.2.c = 0,
			otherwise use II.2.c
III. COST OF MAINTENANCE:			
1. Normal Maintenance	\$ _____		Input
2. Abnormal Maintenance (SEE NOTE 3)	\$ _____		Input
3. Abnormal Amortization	\$ _____		III.2 / 5
4. Amortization Maintenance Carry-over			
from previous years	\$ _____		Input
5. Reimbursed Maintenance	\$ _____		Input
6. Net Maintenance Cost	\$ _____		III.1 + III.3 + III.4 - III.5
7. Unit Cost Maintenance	\$ _____ Per Therm		III.6 / I.3
IV. COST OF CAPITAL:			
1. Acquisition Cost (From Real			
Property Record)	\$ _____		Input
2. Annual Charge (SEE NOTE 4)	\$ _____		IV.1 X 0.1
3. Daily Peak	_____ Therms		Input
4. Systems Capacity (SEE NOTE 5)	_____ Therms		IV.3 X 365
5. Unit Cost of Capital	\$ _____ Per Therm		IV.2 / IV.4

NATURAL GAS (CONT'D)

			INSTRUCTIONS
V. RATE SUMMARY:			
1. Firm			
a. Unit Cost of Purchase	\$ _____ Per Therm		II.1.d
b. Unit Cost of Maintenance	\$ _____ Per Therm		III.7
c. Rate A (Firm)	\$ _____ Per Therm		V.1.a + V.1.b
d. Rate A	\$ _____ Per Therm		V.1.c
e. Unit Cost of Capital	\$ _____ Per Therm		IV.5
f. Subtotal	\$ _____ Per Therm		V.1.d + V.1.e
g. Administrative Overhead	\$ _____ Per Therm		V.1.f X 0.03
h. Rate B (Firm)	\$ _____ Per Therm		V.1.f + V.1.g
2. Interruptible			
a. Unit Cost of Purchase	\$ _____ Per Therm		II.2.d
b. Unit Cost of Maintenance	\$ _____ Per Therm		III.7
c. Rate A (Interruptible)	\$ _____ Per Therm		V.2.a + V.2.b
d. Rate A	\$ _____ Per Therm		V.2.c
e. Unit Cost of Capital	\$ _____ Per Therm		IV.5
f. Subtotal	\$ _____ Per Therm		V.2.d + V.2.e
g. Administrative and Overhead	\$ _____ Per Therm		V.2 X 0.03
h. Rate B (Interruptible)	\$ _____ Per Therm		V.2.f + V.2.g

NOTES:

1. Gas may be measured in KCF (thousand cubic feet), MBTU (million British Thermal Units), or Therms (100,000 BTUs). Conversion factors are as follows:

- BTU factor = BTU content of 1 cu. ft. of gas divided by 1,000 (Use when the heat contents of gas is less than 980 or more than 1020 BTUs).
- Billing MBTUs = KCF X MBTU factor.
- Therms = MBTU X 10 or KCF X MBTU factor X 10.

NATURAL GAS (CONT'D)

2. Normal losses may be estimated at 5 percent. This percentage may be revised to more closely reflect your system.
3. High cost non-recurring maintenance during the year could result in an abnormal variation in the sales rate. This may be avoided by spreading the cost over a period of five years. One fifth of the cost is included each year. Use 25% increase in Rate A as a guide in making decisions to amortize.
4. The 10% factor in calculating the annual capital charge is mandatory.
5. The system capacity may be determined by multiplying the annual peak daily demand by the number of days in a year. Where current peak has dropped considerably, the historical peak of the past five years may be used.

EXPLANATION OF ANY VARIATIONS:

LOCAL PREVAILING RATE: Attach one copy when changes have occurred during the base period.

LIQUIFIED PETROLEUM GAS (LPG)

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared by: _____

I. QUANTITY CONSUMED:

INSTRUCTIONS

- | | | |
|------------------------------------|--------------------|-----------------|
| 1. Quantity Purchased (From Bills) | _____ Gallons | Input |
| 2. Percent Losses (SEE NOTE 1) | _____ % | Input |
| 3. Losses | _____ Gallons | I.1 X I.2 / 100 |
| 4. Quantity Used | _____ Gallons | I.1 minus I.3 |
| 5. Average BTU Content | _____ BTU per Gal. | Input |

II. COST OF PURCHASE:

- | | | |
|---------------------------------|----------|-------|
| 1. Purchase Cost (Actual Bills) | \$ _____ | Input |
|---------------------------------|----------|-------|

Items 2 and 3 must be completed when a rate change has occurred during the 12 months covered by these calculations. Calculate what the monthly billings would have been at the current rate and enter the annual cost in Item 3. Attach a copy of the current rate schedule and your work sheets.

- | | | |
|---------------------------------------|---------------------|--|
| 2. Date of Last Rate Change | _____ | Input |
| 3. Recalculated Cost | \$ _____ | Input |
| 4. Cost of Operating On-Post Facility | \$ _____ | Input |
| 5. Total Cost of Purchase/Operation | \$ _____ | (II.1 or II.3) + II.4
 Use II.1 if II.3 = 0,
 Otherwise use II.3 |
| 6. Unit Cost of Purchase | \$ _____ per Gallon | II.5 / I.4 |

III. COST OF MAINTENANCE:

- | | | |
|---|----------|-------------------------------|
| 1. Normal Maintenance | \$ _____ | Input |
| 2. Abnormal Maintenance (SEE NOTE 2) | \$ _____ | Input |
| 3. Abnormal Amortization | \$ _____ | III.2 / 5 |
| 4. Amortization Carry-over from
previous years | \$ _____ | Input |
| 5. Reimbursed Maintenance | \$ _____ | Input |
| 6. Net Maintenance Cost | \$ _____ | III.1 + III.3 + III.4 - III.5 |
| 7. Unit Cost of Maintenance | \$ _____ | III.6 / I.4 |

LPG (CONT'D)

IV. COST OF CAPITAL:		INSTRUCTIONS
1. Acquisition Cost		
(From Real Property Rec.)	\$ _____	Input
2. Annual Charge (SEE NOTE 3)	\$ _____	IV.1 X 0.1
3. Systems Capacity	_____ Gallons	Input
4. Unit Cost of Capital	\$ _____ Per Gallon	IV.2 / IV.3
V. RATE SUMMARY:		
1. Unit Cost of Purchase	\$ _____ Per gallon	II.6
2. Unit Cost of Maintenance	\$ _____ Per Gallon	III.7
3. Rate A	\$ _____ Per Gallon	V.1 + V.2
4. Rate A	\$ _____ Per Gallon	V.3
5. Unit Cost of Capital	\$ _____ Per Gallon	IV.4
6. Subtotal	\$ _____ Per Gallon	V.4 + V.5
7. Administrative Overhead	\$ _____ Per Gallon	V.6 X 0.03
8. Rate B.	\$ _____ Per Gallon	V.6 + V.7

NOTES:

1. This percentage should reflect your system losses.
2. A high cost nonrecurring maintenance during the year could result in an abnormal variation in the sales rate. This may be avoided by spreading the cost over a period of five years. One fifth of the cost is included each year. Use a 25% increase in Rate A as a guide in making decisions to amortize.
3. The 10% factor in calculating the annual capital charge is mandatory.

EXPLANATION OF ANY VARIATIONS:

LOCAL PREVAILING RATE: Attach one copy when changes have occurred during the base period.

NO. ____ FUEL OIL

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared by: _____

I. QUANTITY CONSUMED:

INSTRUCTIONS

- | | | |
|------------------------------------|--------------------|-----------------|
| 1. Quantity Purchased (From Bills) | _____ Gallons | Input |
| 2. Percent Losses (SEE NOTE 1) | _____ % | Input |
| 3. Losses | _____ Gallons | I.1 X I.2 / 100 |
| 4. Quantity Used | _____ Gallons | I.1 minus I.3 |
| 5. Average BTU Content | _____ BTU per Gal. | Input |

II. COST OF PURCHASE:

- | | | |
|---------------------------------|----------|-------|
| 1. Purchase Cost (Actual Bills) | \$ _____ | Input |
|---------------------------------|----------|-------|

Items 2 and 3 must be completed when a rate change has occurred during the 12 months covered by these calculations. Calculate what the monthly billings would have been at the current rate and enter the annual cost in Item 3. Attach a copy of the current rate schedule and your work sheets.

- | | | |
|---------------------------------------|---------------------|--|
| 2. Date of Last Rate Change | _____ | Input |
| 3. Recalculated Cost | \$ _____ | Input |
| 4. Cost of Operating On-Post Facility | \$ _____ | Input |
| 5. Total Cost of Purchase/Operation | \$ _____ | (II.1 or II.3) + II.4
 Use II.1 if II.3 = 0,
 Otherwise use II.3 |
| 6. Unit Cost of Purchase | \$ _____ per Gallon | II.5 / I.4 |

III. COST OF MAINTENANCE:

- | | | |
|---|---------------------|-------------------------------|
| 1. Normal Maintenance | \$ _____ | Input |
| 2. Abnormal Maintenance (SEE NOTE 2) | \$ _____ | Input |
| 3. Abnormal Amortization | \$ _____ | III.2 / 5 |
| 4. Amortization Carry-over from
previous years | \$ _____ | Input |
| 5. Reimbursed Maintenance | \$ _____ | Input |
| 6. Net Maintenance Cost | \$ _____ | III.1 + III.3 + III.4 - III.5 |
| 7. Unit Cost of Maintenance | \$ _____ per Gallon | III.6 / I.4 |

FUEL OIL (CONT'D)

IV. COST OF CAPITAL:		INSTRUCTIONS
1. Acquisition Cost		
(From Real Property Rec.)	\$ _____	Input
2. Annual Charge (SEE NOTE 3)	\$ _____	IV.1 X 0.1
3. Systems Capacity	_____ Gallons	Input
4. Unit Cost of Capital	\$ _____ Per Gallon	IV.2 / IV.3
V. RATE SUMMARY:		
1. Unit Cost of Purchase	\$ _____ Per gallon	II.6
2. Unit Cost of Maintenance	\$ _____ Per Gallon	III.7
3. Rate A	\$ _____ Per Gallon	V.1 + V.2
4. Rate A	\$ _____ Per Gallon	V.3
5. Unit Cost of Capital	\$ _____ Per Gallon	IV.4
6. Subtotal	\$ _____ Per Gallon	V.4 + V.5
7. Administrative Overhead	\$ _____ Per Gallon	V.6 X 0.03
8. Rate B.	\$ _____ Per Gallon	V.6 + V.7

NOTES:

1. This percentage should reflect your system losses.
2. A high cost nonrecurring maintenance during the year could result in an abnormal variation in the sales rate. This may be avoided by spreading the cost over a period of five years. One fifth of the cost is included each year. Use a 25% increase in Rate A as a guide in making decisions to amortize.
3. The 10% factor in calculating the annual capital charge is mandatory.

EXPLANATION OF ANY VARIATIONS:

LOCAL PREVAILING RATE: Attach one copy when changes have occurred during the base period.

STEAM

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared By: _____

I. QUANTITY CONSUMED:

INSTRUCTIONS:

1. Quantity Purchased (From Bills)	_____	KLb		Input
2. Produced (In-house)	_____	KLb		Input
3. Subtotal	_____	KLb		I.1 - I.2
4. Percent Losses (SEE NOTE 1)	_____	%		Input
5. Losses	_____	KLb		I.3 X I.4 /100
6. Total Steam Consumption	_____	KLb		I.3 - I.5

II. COST OF PURCHASE/PRODUCTION:

1. Purchase Cost (Actual Bills)	\$ _____		Input
---------------------------------	----------	--	-------

Items 2 and 3 must be completed when a rate change has occurred during the 12 months covered by these calculations. Calculate what the monthly billings would have been at the current rate and enter the annual cost in Item 3. Attach a copy of the current rate schedule and your work sheets.

2. Date of Last Rate Change	_____		Input
3. Recalculated Cost	\$ _____		Input
4. In-House Production Cost	\$ _____		Input
5. Cost of Make-up Water	\$ _____		II.5.a X II.5.b
a. _____ KGal			Input
b. \$ _____ per KGal			VI.3 from Water Calculation
6. Cost of Electricity for Pumping	\$ _____ per KWh		II.6.a X II.6.b
a. _____ KWh (SEE NOTE 2)			Input
b. \$ _____ per KWh			V.11 from Electric Calc's.
7. Total Cost of Purchase/Operation	\$ _____		(II.1 or II.3) + II.4 + II.5 + II.6 (Use II.1 if II.3 = 0, otherwise use II.3)
8. Unit Cost of Purchase/Production	\$ _____ per KLb		II.7 / I.6

STEAM (CONT'D)

III. COST OF MAINTENANCE:

INSTRUCTIONS:

1. Normal Maintenance	\$ _____		Input
2. Abnormal Maintenance (SEE NOTE 3)	\$ _____		Input
3. Abnormal Amortization	\$ _____		III.2 / 5
4. Amortization Maintenance Carry-over from previous years	\$ _____		Input
5. Reimbursed Maintenance	\$ _____		Input
6. Net Maintenance Cost	\$ _____		III.1 + III.3 + III.4 - III.5
7. Unit Cost Maintenance	\$ _____	per KLb	III.6 / I.6

IV. COST OF CAPITAL:

1. Acquisition Cost (From Real Property Record)	\$ _____		Input
2. Annual Charge (SEE NOTE 4)	\$ _____		IV.1 X 0.1
3. System Capacity	_____	KLb per Hr	Input
4. Annual System Capacity	_____	KLb per year	IV.3 X 24 x 365
5. Unit Cost of Capital	\$ _____	per KWh	IV.2 / IV.4

V. RATE SUMMARY:

1. Unit Cost of Purchase	\$ _____	per KLb	II.8
2. Unit Cost of Maintenance	\$ _____	per KLb	III.7
3. Rate A	\$ _____	per KLb	V.1 + V.2
4. Rate A	\$ _____	per KLb	V.3
5. Unit Cost of Capital	\$ _____	per KLb	IV.5
6. Subtotal	\$ _____	per KLb	V.4 + V.5
7. Administrative Overhead	\$ _____	per KLb	V.6 X 0.03
8. Rate B	\$ _____	per KLb	V.6 + V.7

STEAM (CONT'D)

NOTES:

1. This percentage should reflect your system losses.
2. Meter readings, when available, are always preferable to estimates. However, Kilowatt-hours (KWh) may be estimated using formulas found in Item III of the water and sewage calculations. An alternate or reduced version of these formulas is:

$$\text{KWh} = (\text{Horsepower} \times 0.746 \times \text{hours of use}) \text{ divided by } 0.65.$$

Please attach copies of your worksheets when estimates are made.

3. High cost nonrecurring maintenance during the year could result in an abnormal variation in the sales rate. This may be avoided by spreading the cost over a period of five years. One fifth of the cost is included each year. Use a 25% increase in Rate A as a guide in making decisions to amortize.
4. The 10% factor in calculating the annual capital charge is mandatory.

EXPLANATION OF ANY VARIATIONS:

LOCAL PREVAILING RATE: Attach one copy when changes have occurred during the base period.

SPACE COOLING (PER SQUARE FOOT)

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared by: _____

I. SQUARE FOOTAGE:

1. Total Served _____ Square Feet

INSTRUCTIONS

Input

II. OPERATION & MAINTENANCE COSTS:

1. Cost of Fuel Oil \$ _____

Input

2. Cost of Natural Gas \$ _____

Input

3. Cost of Labor/Supervision \$ _____

Input

4. Cost of Supplies, Parts, Maint. \$ _____

Input

5. Cost of Water \$ _____

II.5.a X II.5.b

a. _____ KGal.

Input

b. \$ _____ Per KGal

VI.3 from Water Calculations

6. Cost of Electricity \$ _____

II.6a X II.6.b

a. _____ KWH

Input

b. \$ _____ Per KWH

V.11 from Electric Calculations

7. Total O&M Cost \$ _____

II.1 + II.2 + II.3 + II.4 +
II.5 + II.6

III. CAPITAL COSTS:

1. Acquisition Costs \$ _____

Input

2. Annual Charge \$ _____

III.1 X 0.10

3. Unit Cost of Capital \$ _____ per square foot

III.2 / I.1

IV. RATE A:

1. Unit Cost of O&M \$ _____ per square foot

II.7 / I.1

2. Unit Cost of O&M \$ _____ per square foot

IV.1 / 6

SPACE COOLING (PER SQUARE FOOT) (CONT'D)

V. RATE B:			INSTRUCTIONS
1. Rate A (Seasonal)	\$ _____ Per SqFt per Season		IV.1
2. Unit Cost of Capital	\$ _____ Per SqFt per Season		III.3
3. Subtotal	\$ _____ Per SqFt per Season		V.1 + V.2
4. Administrative/Overhead	\$ _____ Per SqFt per Season		V.3 X 0.03
5. Rate B (Seasonal)	\$ _____ Per SqFt per Season		V.3 + V.4
6. Rate B (Monthly)	\$ _____ Per SqFt per Month		V.5 / 6

EXPLANATION OF ANY VARIATIONS:

SPACE HEATING (PER SQUARE FOOT)
ALTERNATE 1 (HOT WATER)

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared by: _____

I. SQUARE FOOTAGE:

1. Total Served _____ Square Feet

INSTRUCTIONS

| Input

II. OPERATION & MAINTENANCE COSTS:

1. Cost of Fuel Oil \$ _____

| Input

2. Cost of Natural Gas \$ _____

| Input

3. Cost of Labor/Supervision \$ _____

| Input

4. Cost of Supplies, Parts, Maint. \$ _____

| Input

5. Cost of Water \$ _____

| II.5.a X II.5.b

a. _____ KGal.

| Input

b. \$ _____ Per KGal

| VI.3 from Water Calculations

6. Cost of Electricity \$ _____

| II.6a X II.6.b

a. _____ KWH

| Input

b. \$ _____ Per KWH

| V.11 from Electric Calculations

7. Total O&M Cost \$ _____

| II.1 + II.2 + II.3 + II.4 +
| II.5 + II.6

III. CAPITAL COSTS:

1. Acquisition Costs \$ _____

| Input

2. Annual Charge \$ _____

| III.1 X 0.10

3. Unit Cost of Capital \$ _____ per square foot

| III.2 / I.1

IV. RATE A:

1. Unit Cost of O&M per season \$ _____ per square foot

| II.7 / I.1

2. Unit Cost of O&M per month \$ _____ per square foot

| IV.1 / 6

SPACE HEATING (PER SQUARE FOOT) (CONT'D)
ALTERNATE 1 (HOT WATER)

V. RATE B:			INSTRUCTIONS
1. Rate A (Seasonal)	\$ _____	Per SqFt per Season	IV.1
2. Unit Cost of Capital	\$ _____	Per SqFt per Season	III.3
3. Subtotal	\$ _____	Per SqFt per Season	V.1 + V.2
4. Administrative/Overhead	\$ _____	Per SqFt per Season	V.3 X 0.03
5. Rate B (Seasonal)	\$ _____	Per SqFt per Season	V.3 + V.4
6. Rate B (Monthly)	\$ _____	Per SqFt per Month	V.5 / 6

EXPLANATION OF ANY VARIATIONS:

SPACE HEATING (PER SQUARE FOOT)
ALTERNATE 2 (STEAM)

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared by: _____

I. SQUARE FOOTAGE:

1. Total Served _____ Square Feet

INSTRUCTIONS

| Input

II. STEAM REQUIRED PER SQ. FT:

1. Total Steam Consumption _____ KLbs

| Input (I.6. from Steam Calc.)

2. Non-Heating Steam _____ KLbs

| II.2.a X 2

a. April-September Production _____ KLbs

| Input

b. Percent Loss _____ %

| Input (I.4. from Steam Calc.)

c. Losses _____ KLbs

| II.2.a. X II.2.b. / 100

d. April-Sept. Steam Consumption _____ KLbs per KSQFT

| II.2.a. minus II.2.c

3. Heating Steam _____ KLbs

| II.1 minus II.2

4. Steam Required _____ KLbs per KSQFT

| II.3 / I.1 / 1000

III. CAPITAL COSTS: (NOTE 1)

1. Acquisition Costs \$ _____

| Input

2. Annual Charge \$ _____

| III.1 X 0.10

3. Unit Cost of Capital \$ _____ Per KSQFT

| III.2 / I.1 / 1000

IV. RATE A:

1. Unit Cost of O&M (Seasonal) \$ _____ Per KSKFT

| II.4 X (V.3 from Steam Calc.)

2. Unit Cost of O&M (Monthly) \$ _____ per KSQFT

| IV.1 / 6

SPACE HEATING (PER SQUARE FOOT) (CONT'D)
ALTERNATE 2 (STEAM)

V. RATE B:			INSTRUCTIONS
1. Rate A (Seasonal)	\$ _____	Per SqFt per Season	IV.1
2. Unit Cost of Capital	\$ _____	Per SqFt per Season	III.3
3. Subtotal	\$ _____	Per SqFt per Season	V.1 + V.2
4. Administrative/Overhead	\$ _____	Per SqFt per Season	V.3 X 0.03
5. Rate B (Seasonal)	\$ _____	Per SqFt per Season	V.3 + V.4
6. Rate B (Monthly)	\$ _____	Per SqFt per Month	V.5 / 6

EXPLANATION OF ANY VARIATIONS:

NOTE 1: Capital costs that are not included in steam production.

SPACE HEATING (PER MCF)

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared by: _____

I. SPACE HEATED:

1. Volume _____ MCF

INSTRUCTIONS

Input

II. COST OF OPERATION:

1. Boiler Plant(s) Operation \$ _____
a. Unit Cost \$ _____ Per MCF

Input

II.1. / I.1

2. Cost of Water \$ _____ Per MCF
a. _____ KGal
b. \$ _____ per KGal

II.2.a X II.2.b

Input

VI.3 from Water Calculations

3. Cost of Electricity \$ _____ Per MCF
a. _____ Kwh
b. \$ _____ Per KWH

II.3.a X II.3.b

Input

V.11 from Electric Calculations

4. Unit Cost of Operation \$ _____ Per MCF

II.1.a + II.2 + II.3

III. COST OF MAINTENANCE:

(Boiler Plants)

1. Normal Maintenance \$ _____
2. Abnormal Maintenance \$ _____
3. Abnormal Amortization \$ _____
4. Amort Maint Carryover from previous years \$ _____
5. Reimbursed Maintenance \$ _____
6. Subtotal \$ _____

Input

Input

III.2 / 5

Input

Input

III.1 + III.3 + III.4 - III.5

(Distribution Systems)

7. Normal Maintenance \$ _____
8. Abnormal Maintenance \$ _____
9. Abnormal Amortization \$ _____
10. Amortization Maint Carryover from previous years \$ _____
11. Reimbursed Maintenance \$ _____
12. Subtotal \$ _____

Input

Input

III.8 / 5

Input

Input

III.7 + III.9 + III.10 - III.11

SPACE HEATING PER MCF (CONT'D)

			INSTRUCTIONS
13. Total Maintenance Cost	\$ _____		III.6 + III.12
14. Unit Cost of Maintenance	\$ _____ Per MCF		III.13 / I.1
IV. CAPITAL COST:			
1. Boiler Plants	\$ _____		Input
2. Distribution System	\$ _____		Input
3. Total Acquisition Cost	\$ _____		IV.1 + IV.2
4. Annual Charge	\$ _____		IV.3 X 0.10
5. System Capacity	_____ MCF		Input
6. Unit Cost of Capital	\$ _____ Per MCF		IV.4 / IV.5
V. RATE SUMMARY:			
1. Unit Cost of Operation	\$ _____ Per MCF		II.4
2. Unit Cost of Maintenance	\$ _____ Per MCF		III.14
3. Rate A	\$ _____ Per MCF		V.1 + V.2
4. Rate A	\$ _____ Per MCF		V.3
5. Unit Cost of Capital	\$ _____ Per MCF		IV.6
6. Subtotal	\$ _____ Per MCF		V.4 + V.5
7. Administrative/Overhead	\$ _____ Per MCF		V.6 X 0.03
8. Rate B	\$ _____ Per MCF		V.6 + V.7

EXPLANATION OF ANY VARIATIONS:

SPACE HEATING (PER MBTU)

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared by: _____

I. QUANTITY:

1. Heat Produced _____ MBTU

INSTRUCTIONS

| Input

II. COST OF OPERATION:

1. Boiler Plant(s) Operation \$ _____

| Input

2. Cost of Water \$ _____

| II.2.a X II.2.b

a. _____ KGal

| Input

b. \$ _____ per KGal

| VI.3 from Water Calculations

3. Cost of Electricity \$ _____

| II.3.a X II.3.b

a. _____ KWH

| Input

b. \$ _____ Per KWH

| V.11 from Electric Calculations

4. Total Cost of Operation \$ _____

| II.1 + II.2 + II.3

5. Unit Cost of Operation \$ _____ Per MBTU

| II.4 / II.1

III. COST OF MAINTENANCE (Boiler Plants)

1. Normal Maintenance \$ _____

| Input

2. Abnormal Maintenance \$ _____

| Input

3. Abnormal Amortization \$ _____

| III.2 / 5

4. Amortization Maintenance Carryover
from previous years \$ _____

| Input

5. Reimbursed Maintenance \$ _____

| Input

6. Total Maintenance Cost \$ _____

| III.1 + III.3 + III.4 - III.5

7. Unit Cost of Maintenance \$ _____ per MBTU

| II.4 / II.1

SPACE HEATING (PER MBTU) (CONT'D)

IV. COST OF CAPITAL:

1. Boiler Plants Acquisition Cost	\$ _____
2. Distribution System Acq. Cost	\$ _____
3. Total Acquisition Cost	\$ _____
4. Annual Charge	\$ _____
5. System Capacity	_____ MBTU
6. Unit Cost of Capital	\$ _____ Per MBTU

INSTRUCTIONS:

|
|
| Input
| Input
| IV.1 + IV.2
| IV.3 X 0.10
| Input
| IV.4 / IV.5

V. RATE SUMMARY:

1. Unit Cost of Operation	\$ _____ Per MBTU
2. Unit Cost of Maintenance	\$ _____ Per MBTU
3. Rate A	\$ _____ Per MBTU
4. Rate A	\$ _____ Per MBTU
5. Unit Cost of Capital	\$ _____ Per MBTU
6. Subtotal	\$ _____ Per MBTU
7. Administrative Overhead	\$ _____ Per MBTU
8. Rate B	\$ _____ Per MBTU

|
|
| II.5
| III.7
| V.1 + V.2

| V.3
| IV.6
| V.4 + V.5
| V.6 X 0.03
| V.6 + V.7

EXPLANATION OF ANY VARIATIONS:

SPACE HEATING BASED ON COAL CONSUMPTION

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared by: _____

I. QUANTITY:

INSTRUCTIONS

1. Delivered to Installation _____ Tons

| Input

II. COST OF UNLOADING:

1. Labor \$ _____

| Input

2. Equipment Rental \$ _____

| Input

3. Other \$ _____

| Input

4. Total \$ _____

| II.1 + II.2 + II.3

5. Unit Cost Unloading \$ _____ Per Ton

| II.4 / I.1

III. PURCHASE COST:

1. Purchase Cost (From Bills) \$ _____

| Input

Items 2 and 3 must be completed when a rate change has occurred during the last 12 months covered by these calculations. Calculate what the monthly billings would have been at the current rate and enter the annual cost in Item 3. Attach a copy of the current rate schedule and your worksheet.

2. Date of Last Rate Change _____

| Input

3. Recalculated Cost \$ _____

| Input

4. Unit Cost of Purchase \$ _____ Per Ton

| (III.1 or III.3) / I.1. Use
III.1 if III.3 = 0, otherwise use
III.3

IV. COST OF FIRING:

1. Labor \$ _____

| Input

2. Equipment Rental \$ _____

| Input

3. Other \$ _____

| Input

4. Total \$ _____

| IV.1 + IV.2 + IV.3

5. Unit Cost Firing \$ _____ Per Ton

| IV.4 / I.1

SPACE HEATING BASED ON COAL CONSUMPTION (CONT'D)

V. COST OF MAINTENANCE:

1. Normal Maintenance	\$ _____	
2. Abnormal Maintenance	\$ _____	
3. Abnormal Amortization	\$ _____	
4. Amortization Maint. Carry-over from previous years	\$ _____	
5. Reimbursed Maintenance	\$ _____	
6. Net Maintenance Cost	\$ _____	
7. Unit Cost Maintenance	\$ _____ Per Ton	

INSTRUCTIONS

Input
Input
V.2 / 5
Input
Input
V.1 + V.3 + V.4 - V.5
V.6 / I.1

VI. COST OF CAPITAL:

1. Acquisition Cost	\$ _____	
2. Annual Charge (SEE NOTE 4)	\$ _____	
3. System Capacity	\$ _____ Tons	
4. Unit Cost of Capital	\$ _____ Per Ton	

Input
VI.1 X 0.10
Input
VI.2 / VI.3

V. RATE SUMMARY:

1. Unit Cost of Unloading	\$ _____ Per Ton
2. Unit Cost of Purchase	\$ _____ Per Ton
3. Unit Cost of Firing	\$ _____ Per Ton
4. Unit Cost of Maintenance	\$ _____ Per Ton
5. Rate A	\$ _____ Per Ton
6. Rate A	\$ _____ Per Ton
7. Unit Cost of Capital	\$ _____ Per Ton
8. Subtotal	\$ _____ Per Ton
9. Administrative Overhead	\$ _____ Per Ton
10. Rate B	\$ _____ Per Ton

II.5
III.4
IV.5
V.7
VII.1 + VII.2 + VII.3 + VII.4
VII.5
VI.4
VII.6 + VII. 7
VII.8 X 0.03
VII.8 + VII.9

EXPLANATION OF ANY VARIATIONS:

SPACE HEATING BASED ON WOOD PELLET CONSUMPTION

Installation: _____ Period from: _____ to _____

Calculations for Fiscal Year: _____ Prepared by: _____

I. QUANTITY:

INSTRUCTIONS

- | | | |
|------------------------------|------------|-------|
| 1. Delivered to Installation | _____ Tons | Input |
| 2. Consumed by Installation | _____ Tons | Input |

II. COST OF UNLOADING:

- | | | |
|------------------------|------------------|--------------------|
| 1. Labor | \$ _____ | Input |
| 2. Equipment Rental | \$ _____ | Input |
| 3. Other | \$ _____ | Input |
| 4. Total | \$ _____ | II.1 + II.2 + II.3 |
| 5. Unit Cost Unloading | \$ _____ Per Ton | II.4 / I.1 |

III. PURCHASE COST (Based on Lbs. of Pellets Consumed):

- | | | |
|-------------------------------|----------|-------|
| 1. Purchase Cost (From Bills) | \$ _____ | Input |
|-------------------------------|----------|-------|

Items 2 and 3 must be completed when a rate change has occurred during the last 12 months covered by these calculations. Calculate what the monthly billings would have been at the current rate and enter the annual cost in Item 3. Attach a copy of the current rate schedule and your worksheet.

- | | | |
|-----------------------------|------------------|---|
| 2. Date of Last Rate Change | _____ | Input |
| 3. Recalculated Cost | \$ _____ | Input |
| 4. Unit Cost of Purchase | \$ _____ Per Ton | (III.1 or III.3) / I.2. Use
III.1 if III.3 = 0, otherwise use
III.3 |

IV. COST OF FIRING (Based on Lbs. of Pellets Consumed):

- | | | |
|---------------------|------------------|--------------------|
| 1. Labor | \$ _____ | Input |
| 2. Equipment Rental | \$ _____ | Input |
| 3. Other | \$ _____ | Input |
| 4. Total | \$ _____ | IV.1 + IV.2 + IV.3 |
| 5. Unit Cost Firing | \$ _____ Per Ton | IV.4 / I.2 |

SPACE HEATING BASED ON WOOD PELLET CONSUMPTION (CONT'D)

V. COST OF MAINTENANCE:

1. Normal Maintenance	\$ _____	
2. Abnormal Maintenance	\$ _____	
3. Abnormal Amortization	\$ _____	
4. Amortization Maint. Carry-over from previous years	\$ _____	
5. Reimbursed Maintenance	\$ _____	
6. Net Maintenance Cost	\$ _____	
7. Unit Cost Maintenance	\$ _____ Per Ton	

INSTRUCTIONS

Input
Input
V.2 / 5
Input
Input
V.1 + V.3 + V.4 - V.5
V.6 / I.2

VI. COST OF CAPITAL:

1. Acquisition Cost	\$ _____	
2. Annual Charge (SEE NOTE 4)	\$ _____	
3. System Capacity	\$ _____ Tons	
4. Unit Cost of Capital	\$ _____ Per Ton	

Input
VI.1 X 0.10
Input
VI.2 / VI.3

V. RATE SUMMARY:

1. Unit Cost of Unloading	\$ _____ Per Ton
2. Unit Cost of Purchase	\$ _____ Per Ton
3. Unit Cost of Firing	\$ _____ Per Ton
4. Unit Cost of Maintenance	\$ _____ Per Ton
5. Rate A	\$ _____ Per Ton
6. Rate A	\$ _____ Per Ton
7. Unit Cost of Capital	\$ _____ Per Ton
8. Subtotal	\$ _____ Per Ton
9. Administrative Overhead	\$ _____ Per Ton
10. Rate B	\$ _____ Per Ton

II.5
III.4
IV.5
V.7
VII.1 + VII.2 + VII.3 + VII.4
VII.5
VI.4
VII.6 + VII.7
VII.8 X 0.03
VII.8 + VII.9

EXPLANATION OF ANY VARIATIONS: